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Title: Ten Years of Land Cover Change on the California Coast Detected using Landsat Satellite Image Analysis

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Abstract: Landsat satellite imagery was analyzed to generate a detailed record of 10 years of vegetation disturbance and regrowth for Pacific coastal areas of Marin and San Francisco Counties. The Landsat Ecosystem Disturbance Adaptive Processing System (LEDAPS) methodology, a transformation of Tasseled-Cap data space, was applied to detected changes in perennial coastal shrubland, woodland, and forest cover from 1999 to 2009. Results showed several principal points of interest, within which extensive contiguous areas of similar LEDAPS vegetation change (either disturbed or restored) were detected. Regrowth areas were delineated as burned forest areas in the Point Reyes National Seashore (PRNS) from the 1995 Vision Fire. LEDAPS-detected disturbance patterns on Inverness Ridge, PRNS in areas observed with dieback of tanoak and bay laurel trees was consistent with defoliation by sudden oak death (*Phytophthora ramorum*). LEDAPS regrowth pixels were detected over much of the predominantly grassland/herbaceous cover of the Olema Valley ranchland near PRNS. Extensive restoration of perennial vegetation cover on Crissy Field, Baker Beach and Lobos Creek dunes in San Francisco was identified. Based on these examples, the LEDAPS methodology will be capable of fulfilling much of the need for continual, low-cost monitoring of emerging changes to coastal ecosystems.

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